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SPECIAL BULLETIN NO. 1
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DEPARTMENT OF PUBLIC HEALTH
STATE OF MONTANA

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Fight Filth for Freedom from Flies

Fly Extermination

"You take my house, when you do take the prop
That doth sustain my house: You take my life,
When you do take the means whereby I live."

—Shakespeare.

An edict has gone forth from the different Health Departments throughout the country that the house fly must be destroyed. "Swat the Fly" has been the war cry, but to allow the fly to breed and then proceed to swat it is a waste of energy.

Entomologists estimate that the progeny of one fly, during a season, under favorable conditions, might reach 250,000,000. Rather than swat the fly, swat the conditions that favor the breeding of the fly; take away the means whereby it lives. The fly's breeding place is filth.. Horse manure is an ideal incubator for this disease spreading insect.

The "clean up" spirit which is manifesting itself in many towns by a day known as "Clean Up Day", should be encouraged, but it should not be spasmodic and confined to one day, but should be continued every day during the warm season. Voluntary and spasmodic effort will do some good, but to be effective the work must be organized and continued. Every incorporated town should have an effective garbage disposal system. The unincorporated towns will have to work under State law. The County Health Officers will find sufficient authority for their clean-up campaigns in the following regulations of the State Board of Health.

Regulation 30—Water Closets, How Constructed, and Located—All human excreta in towns and cities (Incorporated or unincorporated) must be disposed of in sewers, cesspools or vaults. All cesspools and vaults must be made fly-proof and all vaults must be cleaned once each month between the months of May and October of each year, and at such other times as the local, County or State Health Officer shall direct. No cess-

pool, vault, privy or water closet shall be located within 100 feet of any well or cistern.

Regulation 31—Must not Drain into Water Supply—No privy, water closet, pig pen, slaughter house, or barn shall be so located that the surface drainage therefrom shall enter any well, cistern, irrigation ditch or other source of water used for domestic purposes.

Regulation 32—Barns Must Be Cleaned and Manure Disposed of—No person shall put any manure into any street, alley or other highway within one-half mile of any house used as a residence. All manure from any barn or barnyard in any town or city in the State shall be removed at least once in each month of each year between the months of April and October, and at such other times as the local, county or State Health Officer may direct, and shall be deposited at some point not less than one-half mile from any house used as a residence, provided, that manure may be placed on any field or garden where it shall be plowed or spaded under and not allowed to accumulate during the summer months.

Regulation 32 states that "All manure from any barn or barnyard in any town or city in the State shall be removed at least once in each month of each year between the months of April and October, and at such other times as the local, County or State Health Officer may direct." The State Health Officer is on record as directing that between these months the manure in towns or cities must be removed once each week. From the time the egg is laid until the fly is fully developed takes about ten days. If garbage and manure is removed once each week, it will prevent to a large extent the breeding of flies.

Fight filth for freedom from flies.

THE HOUSE FLY.

R. A. Cooley, Entomologist, Bozeman.

If the dirty house fly would remain close around its breeding places where filth abounds, and would not pass from such places to our residences, offices, restaurants, hotels and markets, the case against it would be less grievous. Piles of fermenting horse manure undoubtedly furnish the favorite breeding places, but human excrement and cow manure are also im-

portant, and almost any moist, fermenting organic matter may breed flies in large number. The materials which furnish breeding places are also visited for purposes of feeding and the house fly is an enormous feeder. It follows, then, that the flies which visit our kitchens and dining tables and swarm around exposed foods in the markets, or otherwise come in contact with articles which find their way to the human mouth, are open to grave suspicion. They come with their feet and hairs and the alimentary tract loaded with any germs of disease which may occur in the materials from which they came, and in walking over our foods, the germ laden filth is brushed off. Germs are also deposited with the flies' feces and the fly has a bad habit of repurgitating drops of fluid from the mouth and drinking them up again, and in so doing, may deposit germs. The larger fly specks on windows are formed in this way.

Germs of human diseases are less common in such materials as garbage, stable manure and decaying organic matter than is commonly supposed and our objection to such materials is that they breed the flies that may later visit sources of infection, such as privy vaults and then go where human foods are exposed.

Reduced to a practical basis, then, and briefly stated, the case against the house fly in Montana is that it commonly visits places where human fecal matter bearing germs of intestinal disorders and typhoid fever occurs and passes freely from such places to our kitchens, dining rooms, restaurants and food supplies. The communication then is direct between the sources of germs and the places where they are most to be feared. While the house fly has been more or less definitely connected with a considerable number of human diseases, and suspected of carrying many others, from a practical standpoint, in Montana, only two or three such diseases need be considered.

Of these, infantile diarrhea, and typhoid fever, are the most important and the intestinal discharges are the sources from which they come. The full responsibility of flies in the spread of tuberculosis is not known, but there is much evidence against these insects. It has long been known that flies are particularly fond of sputum and will feed on it wherever found. It has been shown that the excreta of a fly that

has fed on tubercular sputum contain tubercular organisms and that these germs may remain virulent for at least fifteen days.

In Montana, then, we should be interested in the control of flies on account of at least these three diseases—typhoid fever, infantile diarrhea and tuberculosis.

Fly control in Montana calls for the following activities:

(1) Preventing flies from breeding by doing away with, or treating, their breeding places.

(2) Preventing flies from becoming contaminated by keeping all places where human fecal matter is present guarded by screens or otherwise covered. This includes the screening of privies, sewer openings, etc.

(3) Preventing flies from getting into places of human abode, particularly kitchens, dining rooms, restaurants, hotels and markets, where they may deposit germs of disease on foods, the baby's nursing bottle, etc.

The house fly has four distinct stages in its development. One fly lays 120 or more eggs which hatch in a few hours into small white maggots, which feed and rapidly grow, reaching full size in about five days, when the skin contracts and hardens to form a pupa shell or puparium. The pupa stage, again, is about five days and from the pupa comes the adult fly, thus completing the full life cycle which requires a total of about ten days to two weeks, depending upon temperature.

Several generations of the fly occur in one season. The comparatively few adults which live over the winter seek out breeding places in the early part of the summer and the total number of individuals rapidly increases so that by the latter part of July we have what we call the "fly season." Most of the flies that are found about the house in the early part of the season, in April and May, are other species, some of which very closely resemble the true house fly. Only an expert is likely to distinguish between them. These are less important than the house fly, but they do visit both human fecal matter and human foods.

Piles of horse and cow manure, in the back alleys and

around ranch houses, should not be tolerated, but should be removed once a week and spread on the land or otherwise disposed of. There are very few places in Montana where the conditions are such that it is necessary to store stable refuse in boxes and treat it with chemicals as is sometimes done. Fermenting organic matter of any kind should, and need, not be allowed to exist around human habitations.

Cities where sewers are used are less in danger of exposing human excrements to flies than the smaller towns where privies are common. In such small towns the privy vaults should be tightly constructed and screened to prevent all possibility of the entrance of flies. Towns which have sewers should compel their use and the doing away with privies.

In guarding the house against flies, three points may be observed. (1) It is better to trap the flies at the garbage can in the back alley at the barn than in the kitchen or at the back door. More traps, such as the one known as the Hodge fly trap and barn window traps, should be used. (2) The house should be thoroughly screened. (3) Any flies which do succeed in getting into the house should be killed as soon as possible. Sticky fly papers are excellent for this purpose, and under some conditions fly poisons are approved.

TYPHOID FEVER.

By Dr. F. D. Pease, Missoula.

Typhoid Fever is one of the four diseases which cause the largest number of deaths in the United States. It is estimated that during the year 1911 there are 250,000 cases, with 25,000 deaths.

A large percentage of the deaths were among young people, and figuring the earning capacity of these young men and women, for the balance of their lives, at \$4,000.00 each, it means an annual loss of \$100,000,000.00 to our nation. Consequently the health officers have been doing their utmost to stamp out this preventable disease.

In order that a disease may be prevented it is necessary: First, to understand by what methods it is transmitted.

Second, Rules and regulations to control the disease must be enforced by the health officers.

Third, The PUBLIC must be educated to the point of seeing the necessity of co-operation with the authorities.

At present we look upon the following agencies which are the cause of the spread of Typhoid Fever:

First, Water. Second, Foods such as milk, oysters, and vegetables. Third, Flies. And Fourth, What is known as carriers.

Up until the Spanish-American war water was thought to be the principal means by which Typhoid Fever was transmitted. We have a large number of instances where epidemics of this disease can be directly traced to this agent. But while the water undoubtedly plays an important role in the spread of this disease, its importance is being constantly overshadowed by other agencies.

The evidence is now complete that the common house fly may carry the Typhoid Fever Germ and it is appropriately called the typhoid fly. Some very interesting facts have been brought to light in the study of this insect. The house fly lives upon decomposing animal and vegetable matter.

A single female fly will lay about 120 eggs at a time and in the course of from 10 to 14 days the eggs will grow to adults. It has been estimated that the total product of a single fly, in forty days, would equal 810 pounds.

Investigators have found that the number of bacteria on a single fly may range from 500 to 6,000,000.

One bacteriologist found, out of eighteen flies captured near a sick room, that five had upon their bodies the Typhoid Fever Germ.

During the railroad construction work in the western part of Montana, a few years ago, I am satisfied, from my investigations, that a large percentage of the cases was due to the infection being carried from the closet to the food.

If the infection from the fly is to be eliminated it is absolutely necessary for those in charge of camps to see that the regulations of the State Board of Health are strictly adhered to.

The term TYPHOID CARRIER is used to designate a

person who harbors the Typhoid Fever Germs. It has been found that about 2 per cent of those who have had the disease, and about one out of every thousand people who have not had the disease, will excrete the infectious agent, some constantly—others at intervals during their entire lives.

As an example of the way the **carrier** spreads Typhoid Fever, let us suppose that a person who is a cook has an attack of typhoid fever and, after recovering from the disease, goes to work at some camp or hotel. The Typhoid germs are conveyed to the food and the result is an epidemic of the Typhoid Fever.

Or again, a person who is a carrier will be engaged in handling the milk supplies to a city or village. We have records of a large number of just such instances where an epidemic of Typhoid Fever can be traced to a cook or a milkman who, upon investigation, were found to be excreting the infectious agent.

Again, a camp with a large number of men will be free from Typhoid Fever; someone who is a carrier will start to work during the fly season. The result is that the flies will carry the germ from the closet to the food and Typhoid Fever makes its appearance among the men.

At present we have no way, in this State of detecting the Typhoid Carrier, but let us hope that at some future time our people will see the necessity of adequately dealing with the rather common disease—Typhoid Fever.

ADVICE TO MOTHERS ON THE CARE OF BABIES DURING THE HOT MONTHS.

By Dr. C. E. K. Vidal, Great Falls.

The near approach of the summer months brings before us the annually recurrent problem of the large infant mortality from the preventable summer diseases. Here in Montana we are singularly favored over our eastern neighbors by having comparatively cool nights, but still, with each recurring summer, we continue to lose too many babies. Why?

There are two main causes. First, improper food; second, contaminated food.

A baby under one year old should have no food but

milk, either mother's or modified cow's. A baby in the summer time, especially when teething, is very susceptible to digestive disturbances, and it should not be fed anything from the table. Teething itself does not make a baby sick, but it irritates its little nervous and digestive systems and makes it more liable to get sick. It may seem cute to let baby sit up in his high chair and to give him a taste of this and a taste of that, but in doing so you are inviting disaster. After baby is a year old, a little oatmeal jelly, some clear broth with bread broken in it—at eighteen months a little potato, butter and rice is allowable, but you are going to do more harm by overfeeding than by underfeeding. Especial care should be used in feeding fruit to children between one and two years of age. The skins of apples, pears and peaches should be carefully washed and the fruit peeled before you allow your child to have them. Grape skins and seeds should be forbidden. Bananas are hard to digest and only the ripe food should be selected.

Make yourself a committee of one to investigate your milk supply. See that your dairyman is complying with the spirit as well as the letter of the State laws made for the protection of your baby. Milk is subject to contamination before you get it; also don't forget that it is subject to contamination after you get it. Put it in a clean open container as soon as it arrives and to the ice box or the cool ventilated fly-screened cellar with it at once, and keep it there except when you need it. If baby is on the bottle you will be well repaid for scrupulous care of the nipples. Keep three or four in use; scour and boil them daily; and when not in use keep them in a sterile Mason jar. Do not leave the bottles and nipples standing about when not in use. Flies have a special affinity for rubber nipples. When baby gets through nursing remove the nipple, cleanse it, boil it and put it back in your jar. Never use a long tube leading down into baby's bottle, and from the bottle to the nipple. It is a deadly germ trap. Use a simple nipple of good rubber. Fight the flies. They are baby's worst enemies; and don't forget that it is easier to prevent flies coming than to kill them after they come. House flies carry cholera infantum and according to some authorities, stable flies carry infantile paralysis. SWAT THE FLY.

Most mothers keep the babies too warmly clad in the

very hot weather. The babies feel the heat the same as we do. Don't overdress them, but in this country of cool nights a knitted band worn over the abdomen until they are at least two years old is a good thing.

Now, if your baby gets sick with fever, vomiting and diarrhoea, get a doctor at once, but in the meantime give it no food, and this means nothing whatever unless it be an occasional sip of boiled water. In the majority of cases the appropriate thing to do is to give some castor oil at once; keep the bottle in the house: but above all starve the baby and get skilled advice. Cholera infantum is quick and deadly. DON'T WAIT.

HOW TO PREVENT THE BREEDING OF FLIES IN INCORPORATED TOWNS.

By Dr. E. G. Balsam, Billings.

In one sentence I can tell you how to do it successfully, but I will go into details on some points. **Clean up the town. Make it spotless.**

Since the fly is with us it is necessary to screen residences from cellar to garret; business houses of every kind; and barns as well as any building occupied by man or beast.

Then start to destroy the places where the fly can breed. The presence of flies means filth, as a rule, in the vicinity. Dispose of garbage, manure or rubbish, and then keep the place free from decaying animal or vegetable matter, by using metal covered garbage cans, air tight manure boxes, and do not allow rubbish to accumulate.

See that all the old sheds and ramshackle buildings are torn down and burned. Fill in all low places or pools.

Have no privies at all. Show people where they are making the mistake of their lives by not connecting to the sewer. As a matter of fact human excreta is more dangerous than animal.

Keep the streets clean as well as the alleys. It is better to have one or two men with sanitary carts collecting the road refuse than to chance a case of typhoid from a fly.

This topic is dependent on education of citizens along sanitary lines, and no one should be more prominent in this

work than the physician, and especially the health officer. It may not be possible to do it all at once, but make the start and push gradually, never feel satisfied until the town is clean.

FORMALIN KILLS FLIES.

Prof. R. I. Smith, entomologist, N. C. Agricultural Station, says:

"Formalin is a very successful poison for flies in spite of many reports to the contrary. I have recently used it extensively with excellent results. The method that I have found most successful is the use of formalin in milk, with the following proportions:

"One ounce (two tablespoonfulls) of formalin.

"Sixteen ounces (one pint) of equal parts milk and water.

"In this proportion the mixture seems to attract the flies much better than when used in sweetened water. The mixture should be exposed in shallow plates. A piece of bread in the middle of the plate furnishes more space for the flies to alight and feed, and in this way serves to attract a greater number of them.

"I first used this poison in a milk room where the flies were very numerous, and poisoned over 5,000 flies in less than twenty-four hours on several occasions. Over a pint of flies were swept up in this room each time the poison was used.

"Another experiment was used in a large calf barn, where the flies were numerous. I exposed six ordinary sized plates of the formalin poison mixture and killed about 40,000 (four quarts of flies) between 12 o'clock noon and 8 the next morning. This is only an illustration of what can be done with formalin around stables where flies are breeding. I could cite a number of cases where the formalin poison mixture has been used in unscreened kitchens and dining-rooms and resulted in killing practically all the flies.

"A good place to use this formalin is on the front and back porches, where flies are frequently numerous and waiting to enter whenever the doors are opened."—Bulletin of Kansas State Board of Health.

SWAT THE FLY

Two flies rose up from the city street
With poisoned slime all over their feet;
Into the nursery they made a race
and crawled all over the baby's face—

Ta-ra, swat the fly;
Ta-ra, swat the fly.

Three flies flew off from a garbage heap
And over to the table did softly creep;
They danced on the butter and swam in the milk
And washed the filth from their wings of silk—

Ta-ra, swat the fly;
Ta-ra, swat the fly.

Four flies flew in through a screenless door
To just look around the grocery store.
They tasted the sugar and drank in the can
And wiped their noses on the grocery man.

Ta-ra, swat the fly;
Ta-ra, swat the fly.

Five flies flew out of a nasty drain
And started to have some fun again.
They peeved the man with the hairless head,
Then left some germs on the children's bread.

Ta-ra, swat the fly;
Ta-ra, swat the fly.

Six flies danced around in some rotten muck,
Their bodies got covered with typhoid truck;
Into the pantry they raced a heat
And cleaned themselves on the family meat.

Ta-ra, swat the fly.
Ta-ra, swat the fly:

—Indiana Bulletin.

